CLAIMS:

1. A high frequency power supplying device, having two or more loads which are capacitive or inductive,

said high frequency power supplying device being characterized by comprising high frequency power sources for supplying power to the loads, wherein each of the high frequency power sources is provided in proximity to a corresponding load.

2. The high frequency power supplying device as set forth in claim 1, wherein

the high frequency power source has a high frequency power amplifier provided in proximity to a corresponding load.

3. The high frequency power supplying device as set forth in claim 1, wherein

a frequency modulation control section for controlling frequencies of high frequency currents supplied to the loads is provided so as to cause the high frequency power sources respectively provided on the loads to independently and simultaneously supply the high frequency currents, identical with each other or different from each other in terms of a frequency, to the two or more loads, and so as to match impedances of the loads by performing frequency modulation with respect to the high frequency currents supplied to the loads.

4. The high frequency power supplying device as set forth in claim 1, wherein

a phase modulation control section for controlling phases of high frequency currents supplied to the loads is provided so as to cause the high frequency power sources respectively

provided on the loads to independently and simultaneously supply the high frequency currents, identical with each other or different from each other in terms of a phase, to the two or more loads.

5. The high frequency power supplying device as set forth in claim 1, wherein

a power control section for controlling high frequency power supplied to the loads is provided so as to cause the high frequency power sources respectively provided on the loads to independently and simultaneously supply one or more kinds of the high frequency power to the two or more loads.

6. A plasma generation device, comprising: the high frequency power supplying device as set forth in any one of claims 1 to 5; and a vacuum chamber on which the loads are provided, wherein the high frequency power is applied to the loads so as to generate a plasma.

7. The plasma generation device as set forth in claim 6, comprising a measuring section for measuring (i) a high frequency current, (ii) a high frequency voltage, both of which are supplied to each of the loads, (iii) a phase of the high frequency current, and (iv) a plasma generation condition in a vicinity of the load.

8. The plasma generation device as set forth in claim 6, comprising: a negative feedback circuit for generating a control signal from a signal of the high frequency current flowing in the load; and a control system for self-oscillating based on the control signal so as to supply the high frequency power.

9. The plasma generation device as set forth in claim 6, comprising a plasma control section for independently setting phases and frequencies of high frequency currents supplied to two or more loads adjacent to each other, so as to control an effective acceleration potential of an electron in the plasma, the effective acceleration potential being caused by a high frequency electric field generated in the loads adjacent to each other.

10. The plasma generation device as set forth in claim 6, comprising:

a control system for sequentially feedbacking measured values indicative of (i) a high frequency current of the high frequency power, (ii) a high frequency voltage of the high frequency power, (iii) a phase of the high frequency current, and (iv) a plasma condition (plasma density for example) in a vicinity of the load, and for independently and positively controlling the two or more loads in accordance with any one of phase modulation, frequency modulation, and amplitude modulation, so as to control impedance matching performed with respect to the load and so as to control uniformity and reproducibility of the plasma in the vacuum chamber; and

a monitor showing the plasma condition.

11. A plasma generation device, comprising:

a vacuum chamber for generating a plasma;

at least one antenna conductor provided in the vacuum chamber so as to generate an inductive electric field when high frequency power is applied; and

a first insulator disposed around a portion of the antenna conductor which portion exists in the vacuum chamber, wherein the plasma and the antenna conductor are prevented from being in contact with each other by a first space region

intervening between the first insulator and the portion.

12. The plasma generation device as set forth in claim 11, wherein a second insulator is disposed around the first insulator so that a second space region intervenes between the first insulator and the second insulator.

13. The plasma generation device as set forth in claim 12, wherein:

a grounding electrode surrounding the first insulator is provided on an antenna introduction section formed on the antenna conductor so as to be positioned in proximity to an internal wall of the vacuum chamber, and

the second insulator is disposed around the grounding electrode so as to prevent the plasma and the grounding electrode from being in contact with each other.

14. The plasma generation device as set forth in claim 13, wherein the grounding electrode has a zigzag structure in which the grounding electrode alternately protrudes in a direction orthogonal to a conduction direction of the antenna conductor so that a long axis direction of the grounding electrode corresponds to the conduction direction of the antenna conductor.

15. The plasma generation device as set forth in claim 6, comprising a sensor provided in the vacuum chamber so as to measure an intensity of a high frequency inductive magnetic field irradiated from the load.

16. The plasma generation device as set forth in claim 11, comprising a sensor provided in the vacuum chamber so as to

measure an intensity of a high frequency inductive magnetic field irradiated from the antenna conductor.

17. The plasma generation device as set forth in claim 16, comprising a plurality of sensors provided in positions different from each other in terms of a distance from the antenna conductor.

18. The plasma generation device as set forth in claim 17, comprising a plasma control section for controlling a condition, under which the antenna conductor is driven, by calculating a plasma condition in the vacuum chamber on the basis of (i) a measurement result given by each of the sensors and (ii) a value of the high frequency current flowing in the antenna conductor.

19. The plasma generation device as set forth in claim 16, wherein the sensor includes: a magnetic field intensity detection section; and a first shield for covering the magnetic field intensity detection section.

20. The plasma generation device as set forth in claim 19, wherein

the sensor includes a second shield for suppressing formation of an adhering substance on the first shield and for preventing the magnetic field intensity detection section from being shielded from the high frequency inductive magnetic field.

21. The plasma generation device as set forth in claim 20, wherein

the second shield has a slit section for preventing the magnetic field intensity detection section from being shielded from the high frequency inductive magnetic field.

22. The plasma generation device as set forth in claim 6, comprising a power source control section for controlling high frequency power sources so that spatial distribution patterns of plasmas each of which has been generated on the basis of pulsed high frequency power supplied to each load are different from each other.

23. The plasma generation device as set forth in claim 22, wherein the power source control section periodically changes each of the spatial distribution patterns of the plasmas.

24. The plasma generation device as set forth in claim 22, wherein the power source control section independently changes each of the spatial distribution patterns of the plasmas.

25. The plasma generation device as set forth in claim 22, wherein:

the loads are divided into groups adjacent to each other, and

the power source control section causes the groups adjacent to each other to deviate from each other in terms of pulse operation.

26. The plasma generation device as set forth in claim 25, wherein

the power source control section causes the groups adjacent to each other to exclusively deviate from each other in terms of pulse ON/OFF operation.

27. The plasma generation device as set forth in claim 22,

comprising a sensor provided in the vacuum chamber so as to measure an intensity of a high frequency inductive magnetic field irradiated from the load.